

# **Chapter 5 Roadway Sheets**

# **ROADWAY PLAN SHEET DEVELOPMENT**

## CREATING ROADWAY PLAN SHEET DRAWINGS

### Step One: Open your group's ??plan.dgn

Open MicroStation and choose your PIN.

✓ Refer to page 1-11 for more information on opening files.

Locate the **??plan.dgn** that is in your groups MSTA directory (i.e. hdplan.dgn, bdplan, geoplan envplan, etc).

### Step Two: Reference in Survey Data

From the main menu, choose **File > Reference** to open the **Reference** dialog.

Check to see that the appropriate files are attached to this drawing (i.e. contours, topo, points, and text). Wetland data will eventually be in a file called **wetlands.dgn**. If it exists in the topo directory, attach it.

By default, all Survey files should be attached. If these files are not attached, you will have to attach them manually. To reference all files needed for you plan sheets into this file, select **File > Reference (DOT) > Attach**. Browse to the **Topo** directory of your current project (Figure 5-1).

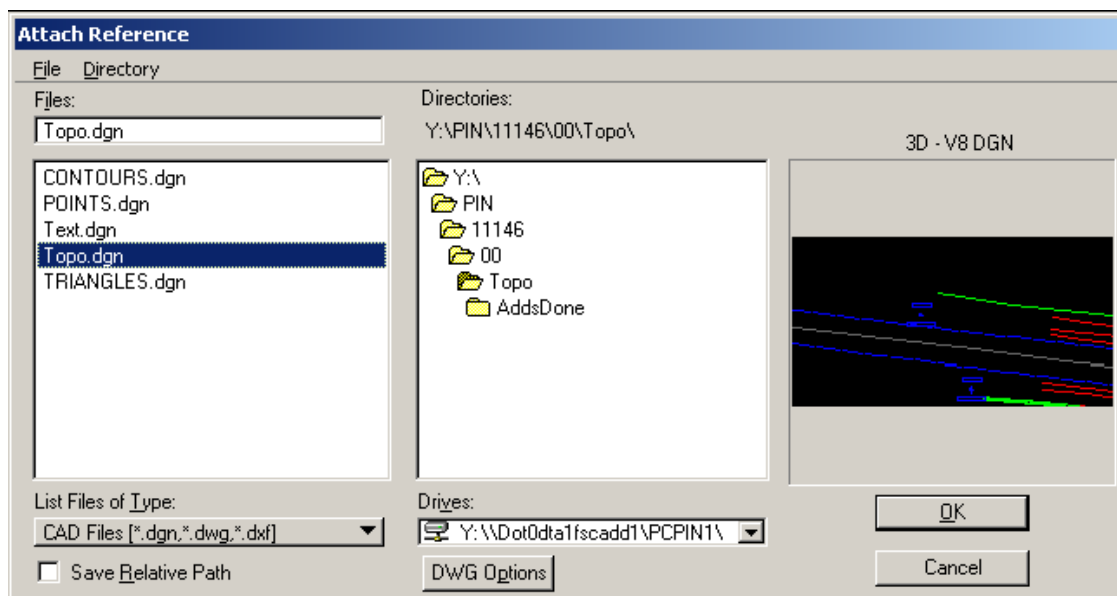


Figure 5-1: The Topo Directory

❗ ***It is important that you attach files from the topo directory and not the survey directory. The files in the survey directory are to be used as backups for the survey section only.***

Pick any one of these files from the **Topo** directory and push **OK**.

This brings up the **Attach Reference Settings** dialog. Below file name and path is the Model drawing that you will be attaching. Typically this will show the attachment of the **Default** model.

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# Roadway Sheets

Next, type in a **Logical Name** (either “topo”, “contours”, “text”, “wetlands” or “points”) for the file.

Now pick **Coincident – World** as your Orientation. This will always line up your drawings based on the coordinates of those files.

Leave the **Scale (Master:Ref)** set to 1:1 and **True Scale** checked on.

If the **Nested Attachments** area grays out on you then that is a good indication that there is no files attached to the file you are currently attaching. If this portion does not gray out then you will need to set this to **No Nesting** or change the **Copy Attachment Depth** value to **0** (Figure 5-2).

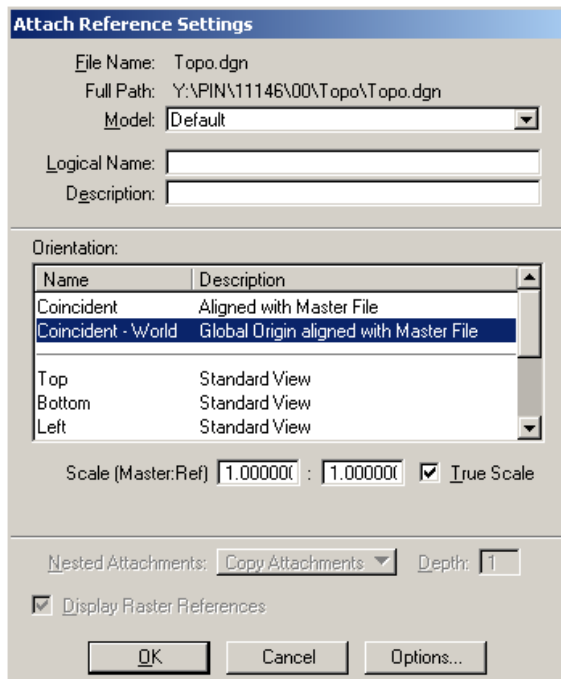


Figure 5-2: Reference Settings

✓ Check page 2-66 for an explanation of Reference File Attachment settings.

Push the **OK** button.

Now repeat these steps until you have attached all the survey files you need to attach.

## Step Three: Attach Proposed Design and Alignment

If the plans you are creating require the proposed design and alignment, attach them using the same method as above. Depending on type of project, bridge or highway, browse to the necessary workgroups \MSTA folder and attach the two files.

Push **Fit View** (Figure 5-3) to see all your reference files.



Figure 5-3: The Fit View Button

- ❗ *If you fit view and the graphics zoom way out and does not maximize in your view window, there may be some problems with a file or files that you have attached. Attempt to correct this before you continue. One common problem is that maybe you attached the file base on Coincident instead of Coincident – World. Shut off the display of your reference files one at a time, fitting view after each one is shut off to try and isolate which file is causing the problem. Once you have isolated the file in question, detach and try reattaching base on the method described previously.*

## Step Four: Sheeting up the Plans

At this stage we are going to be placing rectangles along the alignment that will correspond to our sheets. We will be using the *Plan Sheet Settings Manager* to accomplish this. If it isn't loaded already, go to **Setting > DOT SetMgrs > Plan Sheet Settings**.

✓ *Check page 2-20 for an introduction to the Settings Manager.*

Right Click the **Settings Manager**, choose **Category > Scale** and set your scale (i.e. 1 in.=25 ft. or 1 in.=50 ft.)

From the *Settings Manager*, select **Create Plan Sheets > Place Clip Boundary**.

This selects our sheet boundary cell and activates a cell placement command that will make it easy to place a bunch of these rectangles along the alignment.

Notice the box on the end of your cursor. When you send a *Datapoint* to MicroStation, the box will be placed at that location.

- 🎵 It's best not to snap to elements in your file. If the two elements you snap to are at different elevations, you might end up with a slightly skewed view.

The box you just placed will immediately begin to rotate by the origin point (the point you just entered.) Move your mouse around and notice how it spins. When it is aligned with the roadway, enter another *datapoint* and it will immediately prompt you to place the next boundary.

- 🎵 Don't worry if they're not in exactly the right place. You can go back and clean up any placement later by using the move and rotate tools.

- ❗ *It is important that you place these boundaries in the order that you want your sheets to be numbered. We have a routine that automatically creates the plan files for us, and it will number them in the same order that you place these clip boundaries.*

## Step Five: Placing North Arrows

Start by rotating the view to "top."

✓ *Refer to page 2-11 for help with view controls.*

From the *Settings Manager*, select **Symbols and Linestyles > North Arrow True**.

North is up in your view. It may be necessary to enter 90 degrees in the *Place Active Cell* dialog to orientate the North Arrow to a vertical position. Place the north arrows inside of your clip boundaries in a place that is out of the busy area of your plan (preferably the top center of each sheet).

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## Step Six: Make new Plan Files

Now that you have placed all your sheet borders, we are going to run a macro that will create new plan files for us. From the *Settings Manager* select **Create Plan Sheets > Create Cut Sheets**. This macro is doing a number of things. First off, it is going to run the flatten macro and then create saved views in *xxplan.dgn* that are aligned with the clip boundaries we just placed.

It asks you what number you want to use for the starting number of the plan sheets (Figure 5-4).

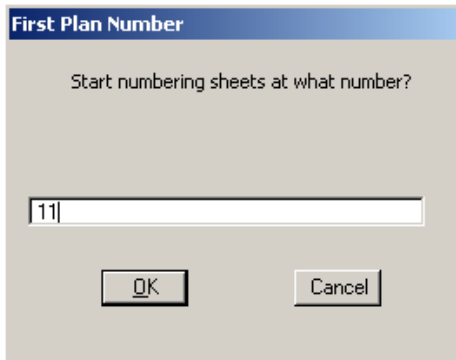


Figure 5-4: Start Numbering At?

♪ Depending on your workgroup, you may have a different starting numbers by default. The number you see is set based on the estimated number of plan sheets that will be place before these sheets in your plan package. You do have the option to change this number at this point in the macro if you have a good feel for your plan package set.

We will go back later and re-number all the sheets once the complete plan package is ready.

Now the macro will ask you what you want to name the file. It is automatically going to comply with a couple of naming conventions: files that will be plotted are all named with a 3 digit number, then an underscore (" \_"), then a sheet type (i.e. "HDPlan, BDPlan, ENVPlan"), then a counter (number 1, 2, 3, etc. that will differentiate between plan1, plan2, etc.) and finally the extension ".dgn." (Figure 5-5).

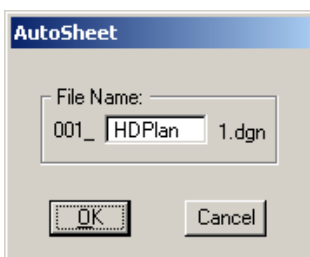


Figure 5-5: File Name

### Press OK

The macro will create and open the first file. Notice the drawing name at the top left of your MicroStation window. Choose the saved view name that matches the prefix of your filename.

- ① *As you go through each drawing, verify the prefix of your filename (Figure 5-6) then be sure to pick the saved view that matches.*



Figure 5-6: Note File Name

The program is going to attach xxplan.dgn to this new file, and it needs to attach by *Saved View*. The *Attach Reference Settings* dialog is going to pop up and demand some input. It is not necessary to enter a logical name or description. The logical name will be filled in automatically based on the saved view name.

- ① *It is not necessary to worry about the Nested Attachments method anymore. This is being preset in the macro to be Live Nesting.*

The first three characters of the new file name should be a number (i.e. 011). This number is the name of the saved view that you want to attach. Select the saved view from the **Orientation** portion of the **Attach Reference Settings** dialog. It is not necessary to adjust the *Nested Attachment* portion of the dialog. We use *Live Nesting* behind the scenes. Click **OK** (Figure 5-7).

✓ Refer to page 2-67 for more information on Nested Attachments.

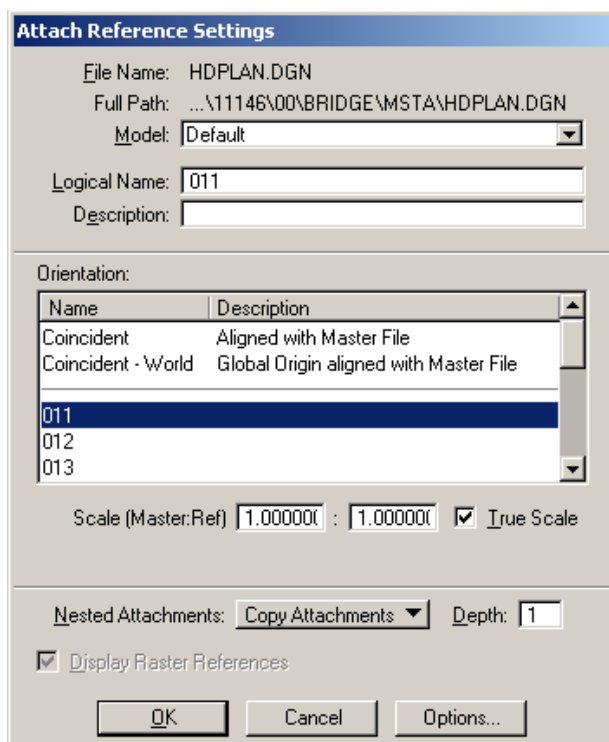


Figure 5-7: Pick a Saved View

This process will repeat for every boundary element you placed.

When you have finished attaching the last of the saved views you've made, it will drop you back into xxplan.dgn and fit the view in a top rotation. Open up the files you've just created and see how they look!

## Live Nesting

What is Live Nesting? This is a new method in MicroStation V8 of attaching a file with references to another file like our border sheets. By using Live Nesting you no longer need to use the old methods of **Batch>Attach** and **Batch>Settings** to manipulate the way you want your cut sheets to appear for plotting purposes. Now if you want to turn off certain levels, adjust displays of reference files or attach/detach additional reference files, you can simply do this in your source drawing (i.e. HDPlan, BDPlan, etc.) and all of your border files will be displayed in the same manner.

## Troubleshooting

If you open a plan sheet drawing and the graphics within the sheet are not correct, it could mean a couple of things.

It could mean that some of the drawings that are referenced in are not at the same Global Origin as the rest of your drawings. See your Support Staff for assistance if needed or read the documentation on Flattening drawings and shifting the global origins.

Or, it could mean that the clip boundary was placed incorrectly. You can fix this without rerunning the "Create Cut Sheets" part of the plan sheet process by following these steps.

- 1) Open the incorrect plan sheet. Go to **File > Reference** - to open reference dialog.
- 2) **Tools > Detach All** to detach the existing reference files.
- 3) Now **Tools > Attach** and be sure to browse to your PIN and select XXPLAN.
- 4) When the **Reference File Settings** dialog comes up, select the "Saved View" from the Orientation area you need (i.e.. 011) and set Nested Attachments method to **Live Nesting**. Now the saved view will be on your cursor.
- 5) Set it down as close to being in the center of your border as possible.

🎵 It is not necessary to give a description or logical name.

## Adjusting Saved Views

You can adjust (re-define) the area of the reference files on your plan sheet by using the reference file dialog **Tools** in combination with the *Place Fence* command.

Place a fence around your sheet frame and highlight all of the reference files. Choose **Tools > Clip Boundary**. This will expand the area of your original saved view to the extents of your fence.

Also, use the **Tools > Clip Mask** to remove parts of a reference file or files.

## Re-sheeting

It is possible to use the macro to recreate these sheeted drawings. The macro will prompt you to overwrite duplicate files.



However, it is not capable of only sheeting up one or two sheets—it's all or nothing. If you need to make a change to xxplan.dgn (move a clip boundary, add a clip boundary, etc.) you're going to have to go through the entire process of sheeting again.

Just a reminder, it can only sheet up files in the order that the clip boundaries were placed in the file. If you need to add sheets at the beginning of the project, it might be easier to delete all your clip boundary cells that you placed and start again from scratch (using *Settings Manager Create Plan Sheets > Place Clip Boundary*).

## **CLEAN-UP THE PROPOSED DESIGN FILES**

Once the proposed design files have been created in MX and are placed in your PIN directory, there is some cleanup required.

### **Editing the Alignments.dgn**

We will be using a macro to draw the centerline in MicroStation. This will produce true curves and a complex chain that will facilitate measurement.

The MX designer must place the **dab-alignments.prn** file into your projects PIN directory under the MSTA folder. This is the default directory that the macro points to.

### **Step 1: Open the Alignment Drawing**

Open your alignments.dgn design file and *Fit View*.

### **Step 2: Run the Macro**

On the *Settings Manager*, select **Category > Scale** and pick the scale in which you will be printing your drawings. U. S. Customary projects; this is typically one of two scales, 1 in. = 25 ft. or 1 in. = 50 ft. (1:250 or 1:500 for metric projects).

Using the *Plan Sheet Settings Manager*, which should have automatically loaded, select **Proposed Alignment>Create Alignment String**.

This opens a dialog that prompts the user to select the dab-alignments.prn file for your project.

🎵 Verify that the default directory is indeed your projects directory. If the path is pointing to a project other than yours, exit MicroStation. Open MicroStation by clicking on the icon and select your project from the **Project** pull down.

If your directory is OK, select the file and press **OK** to have the macro draw your centerline string.

### **Step 3: Rotating “Flag” Text**

The PC's and PT's may need to be rotated 180 degrees so that they are easy to read if looking from the rightmost edge of your plan sheet.

To do this, use the **Rotate** tool in the main toolbox, set the mode to **active angle** and set your angle to 180 degrees.

If the flag line requires trimming, use the **Extend Element** tool.

### **Step 4: Placing Curve Data**

#### **Open dab-alignments.prn**

The curve data exists in the same file that the macro used to run to generate the centerline string. Using *Windows Explorer*, browse to your PIN directory. Open the **dab-alignments.prn** file.

♪ You may get a dialog that asks you what program you would like to use to open this file. Choose either PFE32, or Notepad. Check the box to “Always use this program to open this file”.

### Place and Edit the Curve Data Cell

From the *Settings Manager*, select **Proposed Alignment>Curve Data Cell**.

Place it between your PC and your PT with a *Datapoint*. Now the cell is dynamically rotating around your cursor. Click again to finish rotating it correctly.

Depending on what text editor you are using you may or may not need to drop the cell to edit the text. We will assume you are using the standard text editor.

Once you drop the cell **Qualities>Drop>Complex**), use your **Edit Text** tool and either type or copy and paste the information into the text editor dialog from the **dab-alignment.prn** file.

## Step 5: Placing Bearings

To place your bearings, choose **Proposed Alignment > Centerline Bearings** from the *Settings Manager*. *Datapoint* on a tangent line.

❗ *Be sure that your proposed centerline highlights, as opposed to the existing centerline string located in the topo.dgn.*

The resulting label shows both distance and bearing. All we want to display is the bearing. Remove the distance by using the **Edit Text** tool. *Datapoint* on the distance/bearing label to open the **Dimension Text** dialog (Figure 5-8).

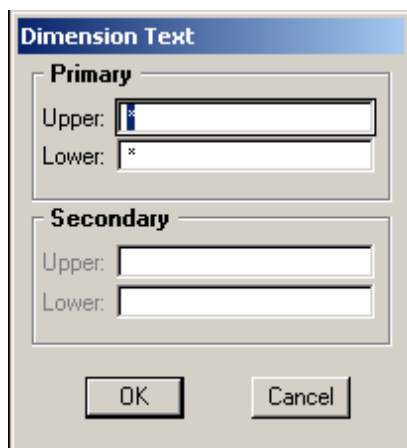


Figure 5-8: Edit Dimension Text

Replace the “\*” in the **Upper** field with a space.

❗ *You can't just delete the “\*”.*

Hit **OK** to apply the change.

Verify that the bearing matches the bearing in your **dab-alignments** file. If it doesn't, edit the text and supply the value from the **dab-alignments** report. This is the correct bearing for the centerline.

- ♪ Due to the current working units of the drawing cube in MicroStation, there is not enough precision to accurately formulate the bearings.
- ♪ If the bearing you placed is upside down compared to the centerline text, drop the dimension (**Qualities>Drop>Dimension**) then rotate the text 180 degrees.

## Step 6: Flatten the Drawing

Go to **Macros>Flatten**. Click **OK** to accept 0 as the desired elevation. Click a data point anywhere in the view window to initiate the command.

## Editing the Proposed Design (i.e. Highway.dgn or Bridge.dgn)

MX produces most of our proposed design files (i.e. highway.dgn or bridge.dgn). The file is in a very raw format. There are a handful of elements that require adjustment to their linestyle. Some of them are *cut lines*, *fill lines*, *ditch lines*, *curbing*, *retaining walls*, *guardrail* and *possibly drainage lines*. This section describes how to select like lines and make adjustments “Globally” to set the appropriate symbology of the elements in MicroStation.

## Step 1: Identify Elements Using MX Enquire

Under the **Macro** menu, choose **MX String Info**. An **Enquire** button should pop up (Figure 5-9).



Figure 5-9: Mx Enquire

Press the **Enquire** button.

### ① Turn the Graphic Group lock off.

Click an element to find out what it is called. The attributes of the element you picked will be displayed in a new dialog window (Figure 5-10).

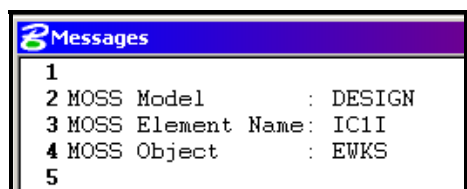


Figure 5-10: MX Enquire Message display

The **Element Name** is what you are interested in most; however, the name may not be clear as to what it represents. Go to **Macros>MX String Search** and enter the “Name” of the element. If this element name has numbers in it, supply the characters then use the wildcard “\*\*” in place of the numbers. If the Designer used standard naming convention for the MX elements, the *Name* of the element should be displayed in the dialog giving you a better idea what the element might be. The designer may also be able to give you some insight on what he or she named the elements.

Go to **Macros > Select By MX Attributes** (Figure 5-11).

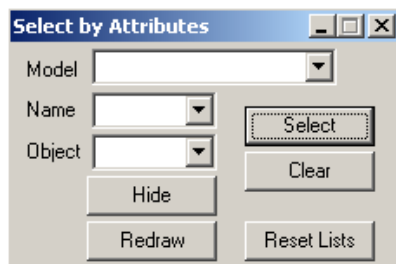


Figure 5-11: Select by MOSS Attributes

Under the **Model** pull down, select the model.

🎵 There may be multiple models in your drawing, but normally, there is only one called **Design**.

In the **Name** field, type in the name of the object you wish to have selected. If this element name has numbers in it, supply the characters then use the wildcard “\*\*” in place of the numbers.

Hit **Select** to pick the elements. This will select all MX elements in your drawing that have the same name.

## Step 2: Setting the Attributes

The quickest way to set the attributes of an element is to utilize our *Plan Sheet Settings Manager*.

On the *Settings Manager*, select **Category > Scale** and pick the scale in which you will be printing your drawings. U. S. Customary projects; this is typically one of two scales, 1 in. = 25 ft. or 1 in. = 50 ft. (1:250 or 1:500 for metric projects).

For example, if what you **Enquired** appears to be a proposed slope line, choose **Proposed Slope Lines > Cut Line** or **Fill Line** to set the attributes.

❗ *If you find that the cut and fill lines are not sized correctly then you should verify you Category>Scales is set correctly from the Settings Manager prior to selecting any thing in the Settings Manager.*

🎵 All of your slope lines may be named the same; therefore they will all be selected and changed to the attributes of a cut line or a fill line. Select the slope line type based on what the majority is for your project.

The name “IC” means interface cut. The name “IF” means interface fill. If proper naming was used, you should be able to pick them individually.

## Step 3: Changing the Attributes

Click on the **Change Element Attribute** tool in the main toolbar. Make sure **Method** is set to **Change** and place a check in all of the other attributes boxes except for **Class** and **Use Fence**. By using the *Settings Manager*, Level, Color, Style and Weight should be set for you. Click on the screen to change the attributes.

Repeat the steps above on all elements that require a custom line style in MicroStation (i.e. Ditch arrows, slope lines, retaining walls, curbing, and sometimes, proposed underdrain).

### **Step 4: Finishing Up**

Once all custom line styles are changed to the proper style, all that remains in the active drawing are lines that represent the travel way, edge of shoulder, back of sidewalks and boundaries of entrances, etc.

These lines should be selected and changed to a weight 3. Using the **Edit > Select By Attributes**, check the box to select attributes by weight of “0”. Hit **Execute**. Only these should highlight. Now, use the *Change Element Attributes* tool and select only the weight and set the number value to 3. Click on the screen to make the change. Close the *Select By Attributes* and click **Cancel** to stop filtering elements.

### **Step 5: Flatten the Drawing**

Go to **Macros>Flatten**. Click **OK** to accept 0 as the desired elevation. Click a data point anywhere in the view window to initiate the command.

# PROFILE SHEET DEVELOPMENT

## PROFILE DRAWING GENERATION

### Discussion

To work on the Profile drawings, they must first be generated from Mx and placed in your projects PIN directory on the Y: drive. Typically, there are two standard scales for profiles, 1"=25' scale and 1"=50' scale (1:250 or 1:500 metric). Find out which scale was used to generate the profiles.

### Rename file to look alike (Optional)

Use your *Windows Explorer* to browse to your PIN directory and browse to your workgroups MSTA folder. The majority of the files should have names like *PROF-DESIGN-MC10\_dr\_002.dgn*. When MX creates these files using the wizard, it doesn't add part of the filename to the first file.

Rename this file (**File>Rename**) in *Windows Explorer*, adding **\_dr\_001** to the end of the file name.

### Step One: Symbology Correction

Drawings that have been processed from Mx to MicroStation are now full-size and the standard border is already placed. The only issue is the symbology of our borders comes over as gray.

🎵 All Profile drawings need to be processed, if you see that the borders are gray, process these files by selecting **Macros>Fix Borders (XS/PROF)** from the main menu.

❗ *If you did receive Profile drawings from your designer (Mx user) and there were no borders in the files, then please ask the designer to redisplay the drawings in Mx with the appropriate settings for translation.*

When the macro finishes processing the files, it will open the first file.

### Step Two: Rename the Drawings

Close out of MicroStation. Using the "Sheet Renumbering Utility", organize the sheets, using placeholders if necessary, so that the profiles are after the plan sheet. This will add the number prefix to the drawings. If you do not do this, you will not be able to take advantage of automatically filling in the variables in the drawings (Editing the PCF).

✓ *Check page 1-16 for instructions for using the Sheet Renumbering Utility.*

### Step Three: Edit the PCF File

"Project Configuration files" are files that contain project specific information that will be used by a macro to substitute project information for variables into your Border. Any text on the border that has a "\$" is a variable. Examples of variables are *Town or City, Street or Rte, PIN, Project Number*.

✓ *Refer to page 1-19 for complete instructions on Editing the PCF file.*



## **Step Four: Border Information**

If you would like to replace the variables in your border, run the Border Information Macro. This is kicked off after editing the PCF file, but it can be run as a separate step.

✓ *Refer to page 1-21 for complete instructions on running the Border Information macro.*

## **More Cleanup**

Using the profile *Settings Manager*, place all dimensions; text and symbols required on your profile drawings using the **Profile Settings Manager**. Refer to a sample set of profiles, your Plan Development Guide or Highway Design Guide for what is required and to see how they should look. For additional information, contact CADD Support.

# **CROSS SECTIONS SHEET DEVELOPMENT**

## **WORKING WITH CROSS-SECTIONS**

### **Discussion**

To work on the Cross Section drawings, they must first be generated from MX and placed in your projects PIN directory on the Y: drive. Currently, there are only two scales for Cross Sections: 1 in.=5ft. and 1 in.=10ft (1:50, 1:75 or 1:00 metric). Find out which scale was used to generate the Cross Sections.

Bridge Program users only use MX to produce Cross Sections with old ground on them, you can use the **Template** macro to produce the proposed lines on your sections. The macro can be found in the main menu under **Macros>Template**.

✓ *For detailed instructions on using the template macro, refer to page 4-20.*

### **Rename file to Look alike (Optional)**

Use your *Windows Explorer* to browse to your PIN directory and browse to your workgroups MSTA folder. The majority of the files should have names like *XSMC10\_dr\_002.dgn*. When MX creates these files, it doesn't add part of the filename to the first file.

Rename this file (**File>Rename**) in *Windows Explorer*, adding **\_dr\_001** to the end of the file name.

### **Step One: Symbology Correction**

Drawings that have been processed from Mx to MicroStation are now full-size and the standard border is already placed. The only issue is the symbology of our borders comes over as gray.

♪ All Cross Section drawings need to be processed, if you see that the borders are gray, process these files by selecting **Macros>Fix Borders (XS/PROF)** from the main menu.

① *If you did receive Cross Section drawings from your designer (Mx user) and there were no borders in the files, then please ask the designer to redisplay the drawings in Mx with the appropriate settings for translation.*

### **Step Two: Rename the Drawings**

Close out of MicroStation. Using the "Sheet Renumbering Utility", organize the sheets, using placeholders if necessary, so that the Cross Sections are after the Profile sheets. This will add the number prefix to the drawings. If you do not do this, you will not be able to take advantage of automatically filling in the variables in the drawings (Editing the PCF).

✓ *Check page 1-16 for instructions for using the Sheet Renumbering Utility.*

### **Step Three: Edit the PCF File**

"Project Configuration files" are files that contain project specific information that will be used by a macro to substitute project information for variables into your Border. Any text on

the border that has a “\$” is a variable. Examples of variables are *Town or City*, *Street or Rte*, *PIN*, *Project Number*.

✓ Refer to page 1-19 for complete instructions on Editing the PCF file.

## Step Four: Border Information

If you would like to replace the variables in your border, run the Border Information Macro. Usually this is kicked off after editing the PCF file, but it can be as separate steps.

✓ Refer to page 1-21 for complete instructions on running the Border Information macro.

## More Cleanup

### Step One: Clean up the file

Using the **Edit Text** tool or selecting **Text>Edit Text** from the *Main Menu*, replace the X+XXX and the Y+YYY with the first and last station numbers on your sheet.

🎵 Complete this procedure to all of your Cross Sections before you start plotting singles.

### Step Two: Plotting Existing & Proposed “Singles”

There are many items that need to be plotted on the Cross Sections. Trees, Poles, Buildings, Drainage Features, Underground Utilities and Text associated to each of them. We have a **Cross Section Setting Manager** designed specifically for this task that will help keep our files standard. It should be automatically loaded.

🎵 Remember to place these items on the closest possible section.

Right click on the *Settings Manager*, choose **Category > Scale** and select the scale of your Cross Sections (i.e. 1 in.=5ft. and 1 in.=10ft (1:50, 1:75 or 1:00 metric)).

### Step Three: Plotting Cells

Some cells are created with origins for the Left and for the Right side of the centerline and some have the origin located in the center of the cell. The trees, for instance, have a bottom center origin, but need to be plotted to the face of the tree, depending on whether it is on the left or the right.

The following is the procedure for plotting singles that have a proper origin.

Go to the left pull down of your *Settings Manager* and choose the category of singles you are plotting. In the right pull down, select the specific cell you want to plot.

You will find that the cell you selected is now on your pointer. With your focus in *Accudraw*, tentative to one of the centerline tick marks and type an “O” to set your Accudraw Compass to this point.

Move the cell horizontally in the X direction, either left or right, and type in the offset. This offset will be locked for the time being. Move the cell up or down until you have it positioned on the old ground.

🎵 Snap to the ground using your **Nearest** snap (type N into *Accudraw*).

Some items, drainage and utilities, have their own level for text placement, use the appropriate text associated to these cells from the settings manager (i.e. **Exist. Utilities>Utility Text**). For all other text associated to existing cells, select **Existing Text (Misc)>Standard Text (Normal)** from the *Settings Manager*.

A *Text Editor* window opens and waits for your entry. Enter your text in this field and it will be attached to your pointer, waiting for the user to provide a position on your screen.

If you are cutting and pasting from another program, go to this program, select the text and select **Edit>Copy** or **Ctrl+C** on your keyboard and go back to MicroStation and select **Edit>Paste** or **Ctrl+V** into the **Text Editor** window.

Because the tree cell's origin is at the bottom center of the cell, the user needs to take notice of where the temporary dashed line crosses the existing ground string during placement of the cell. At this point, hit the "L" key twice and it will release the lock in the X direction allowing the user to move the cell horizontally until the face of the tree is aligned where the temporary line that was crossing the existing ground. *Datapoint* to place it.

♪ Please note that the Survey Section defines the face of the tree closest to the centerline of the road.

## Step Four: Manipulating The Template

The Template (proposed design) most likely needs some editing, or at the least, additions. For an example, all cross section on each sheet need offsets to the toe of slope, and cut and fill quantities. There are many ways to do one thing in MicroStation, so we will describe the method we found easiest and fastest.

### Part One: Adjusting slopes

When adjusting or modifying a line, set your snap mode to *Keypoint*.

Use the *Modify* tool (**Stretch > Modify**).

Snap to the end of the line, and (using your *Accudraw* shortcut keys) snap to the new location with a **I** for intersection or provide an offset value by snapping to the centerline and type **O** for origin and slide in the X direction and enter a value. Move in the Y direction until you are near the old ground and hit the **N** on your keyboard then *Snap* to the old ground.

### Step Two: Creating slopes.

*Accudraw* makes it very easy to create lines at a slope or percentage.

Use the *Cross-Sections* Settings Manager to control the appearance of new lines. From the **Settings Manager**, choose **Template Lines and Symbols > Finished Grade and Slope**. This will set the proper Level, Color, Style and Weight as well as launching the *Smartline* command.

To place a slope specified as "rise / run", snap and *Datapoint* to begin the line. Gesture left or right and type the "run" value of your slope into *Accudraw*. Gesture up or down and enter the "rise" value of your slope into *Accudraw*. Type "A", while focus is in *Accudraw*, to lock the angle of the line. Use a *Nearest* snap and click on the old ground.

✓ Refer to page 2-51 for a description of using *Accudraw* to place lines at a percent slope.

If you need to trim a slope line to the old ground, use the *Extend Element to Intersection* tool and hit the line you want to extend, and then hit the line that you want it to extend to.

Use the *Construct Circular Fillet* command to place rounded ditch slopes (**Zip > Fillet > Fillet**). In the **Construct Circular Fillet Tool Settings Window** (Figure 5-12) make a guess on the **Radius** of the fillet and set the **Truncate** value to **First**.



Figure 5-12: Fillet Tool Settings Window

This command requires two *Datapoints*. The first point indicates the element that is going to be cut (“truncated”). Pick your proposed slope line. The second point identifies the line to trim the first line to. Pick the existing ground to the outside of the slope.

♪ If you don’t like the results, try a different radius.

### Step Three: Labeling Slopes

Labeling slopes have been made easier by using the *Settings Manager*. Select **Proposed Text and Dims>Slope%** and snap and *Accept* on both ends of the line you are labeling. The slope will appear in your *Text Editor*. It is ready for placement. *Snap* to the middle of the line and *Accept* to finish the placement.

✓ For more detailed information about the *Slope%* macro, refer to page 2-82.

### Step Four: Subgrade and Driveway Cleanup

The rest of the cleanup may consist of drawing subgrade lines for your main line and your drives. Be sure to use your *Settings Manager (Template Lines and Symbols)* to control the Level, Style, Color and Weight of these lines. Refer to the Standard Details when adjusting driveways. Use the **Proposed Text and Dims>Slope%** macro to label the driveway slopes.